

What is claimed is:

- 1 1. An apparatus, comprising:
2 an enclosure having an opening; and
3 a light-emitting device inside the enclosure;
4 wherein the light emitted through the opening is only visible to a speaker
5 when the speaker's mouth is within a sensitivity region of a microphone.
- 1 2. The apparatus recited in claim 1, wherein the enclosure has sloped sides.
- 1 3. The apparatus recited in claim 1, wherein the walls of the enclosure are
2 coated to absorb light.
3
- 4 4. The apparatus recited in claim 1, wherein the opening is asymmetrical.
- 1 5. The apparatus recited in claim 1, wherein the enclosure is cylindrical.
- 1 6. The apparatus recited in claim 5, wherein the light-emitting device is
2 located on the bottom inside the enclosure.
- 1 7. The apparatus recited in claim 6, wherein the opening is located on the
2 top of the enclosure.
- 1 8. An apparatus, comprising:
2 an enclosure having an opening to a cavity;
3 a device to emit light at the bottom of the cavity; and
4 a cover over the light-emitting device to diffuse the light;
5 wherein the light emitted from the opening is only visible to a speaker
6 when the speaker's mouth is within a sensitivity region of a microphone.

1 9. The apparatus recited in claim 8, wherein the sides of the cavity are
2 sloped.

1 10. The apparatus recited in claim 8, wherein the depth of the cavity and the
2 size and shape of the opening are designed so that the light emitted from the
3 opening is only visible when the speaker's mouth is within the sensitivity region.

1 11. The apparatus recited in claim 8, wherein the enclosure is capable of
2 attaching to the microphone.

1 12. A system, comprising:
2 a microphone having a sensitivity region; and
3 a plug capable of coupling to the microphone, the plug having an
4 enclosure and a light-emitting device inside the enclosure to provide visual
5 feedback to direct a speaker to stay within the sensitivity region.

1 13. The system as recited in claim 12, wherein the microphone is a
2 microphone array.

1 14. The system as recited in claim 12, wherein the microphone array uses
2 time delay estimation to establish the sensitivity region.

1 15. The system as recited in claim 12, further comprising a speech
2 recognition application using input from the microphone.

1 16. The system as recited in claim 12, further comprising a speaker
2 verification application using input from the microphone.

1 17. The system as recited in claim 12, further comprising a conferencing
2 application using input from the microphone.

- 1 18. The system as recited in claim 12, further comprising a telephony
2 application using input from the microphone.
- 1 19. The system as recited in claim 12, further comprising a tablet coupled to
2 the microphone.
- 1 20. The system as recited in claim 12, further comprising a computing device
2 coupled to the microphone.
- 1 21. The system as recited in claim 12, further comprising an appliance
2 coupled to the microphone, the appliance receiving control input from the
3 microphone.
- 1 22. The system as recited in claim 12, further comprising, an automobile
2 application using input from the microphone.
- 1 23. A method, comprising:
2 providing an enclosure having a bottom, an opening, and a depth;
3 attaching a light-emitting device to the bottom of the enclosure, wherein
4 the light-emitting device has a top surface;
5 calculating an angle theta (θ) so that the light-emitting device is only
6 visible to a talker when the talker's mouth is within a sensitivity region of a
7 microphone; and
8 manufacturing the opening and depth of the enclosure so that the angle
9 theta (θ) is an angle between the top surface of the light-emitting device and a
10 projection line drawn from an edge of the opening to an opposite edge of the
11 light-emitting device.
- 1 24. The method as recited in claim 23,
2 wherein calculating the angle theta (θ) is performed by calculating $\theta =$
3 $\arctan(\beta / \alpha)$;

4 wherein beta (β) is a length of an orthogonal projection between an edge
5 of the opening and the bottom of the enclosure; and

6 wherein alpha (α) is a distance between the opposite edge of the light-
7 emitting device and the orthogonal projection.

1 25. The method as recited in claim 23, further comprising:

2 providing a cover over the light-emitting device to diffuse the light;

3 wherein theta (θ) is the angle between the top surface of the light-
4 emitting device and the projection line drawn from the edge of the opening to the
5 opposite edge of the cover over the light-emitting device.

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